

which joins the upper and lower principal surfaces. Particularly, the outer surface is a molding free face.

Additionally, the magnetic disc includes an inner surface joining the upper and lower principal surfaces, such that the inner surface defines a through-hole in a central portion of the substrate. Further, the upper and lower surfaces have a mirror surface property transcribed thereon.

An outer diameter of the magnetic disc satisfies a desired dimensional tolerance by selecting a predetermined volume of glass and the thickness of molded glass substrate, such that a desired dimension and tolerance is satisfied by adjusting a barrel die size.

Furthermore, the upper and lower surfaces have a small waviness W_a of no greater than 0.5 nm.

A. Waviness (W_a) vs. Roughness (R_a)

Sakai is completely silent to waviness. Sakai discloses roughness as a measure, which is important to achieving particular characteristics, namely high memory performance and high Contact Start Stop (CSS) durability. There is no suggestion of a waviness that is not greater than 0.5 nm, as required by claim 1.

Waviness is a measure of deviations of a surface from its nominal shape at widely spaced wavelengths, whereas roughness is a measure of fine irregularities of the surface at the shortest wavelength. While waviness may be a function of work deflections, vibrations, chatter, and material strains attributed to an individual machine, roughness is typically irregularities in the process or method of manufacturing.

In other words, roughness is directly related to a process of engineering a surface, where waviness is considered independent of a process. For example, two magnetic

disks may be made by the same process, and thus, the magnetic disks may have a similar roughness. However, the magnetic disks may exhibit a substantially different waviness, because different devices were used to produce the two magnetic disks. This is illustrated by the following figure, which is presented herein for the sole purpose of facilitating understanding of similar roughness, having substantially different surface profiles (*i.e.*, a two-dimensional graph of the shape of the surface in a plane perpendicular to the surface).

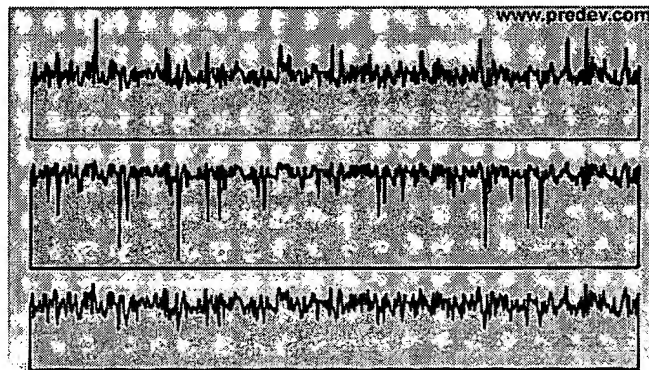


Figure 1- Same Roughness, Different Profile

In the above Figure 1, the three surfaces have the same roughness, but obviously different surface profiles. Thus, substantially the same roughness (and/or maximum height of the profile (R_y)) do not *necessitate* a substantially the same waviness. Therefore, the substantially the same roughness characteristic and maximum height of the profile are not inherent to the waviness of a surface. It is well known in the art that roughness of a surface profile may be substantially the same, however, other characteristics, *e.g.*, waviness, spacing, *etc.*, must be take into account to distinguish surface profiles of magnetic discs.

With respect to the assertion that waviness no greater than 0.5 nm is inherent in the disclosure of Sakai, the Applicant respectfully refers to MPEP §2112, which states,

“The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). Additionally, MPEP §2112, citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999), sets forth that

To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' (emphasis added)

Finally, MPEP §2112, citing *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990), states that

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. (emphasis in original)

Accordingly, objective evidence or cogent technical reasoning to support the conclusion of inherency must be provided by the Examiner if the assertion that waviness of no greater than 0.5 nm is maintained. In view of the above comments, claim 1 is neither disclosed nor obvious in view of Sakai.

B. Molding Free Face

Further, Sakai does not teach a molding free surface as required by claim 1. Claim 1 recites, “an outer surface joining the upper and lower surfaces, wherein the outer surface is a molding-free face.”

It is asserted that a molding-free face is a process limitation. However, the molding-free face provides a definite, physical description of the outer surface, which

joins the upper and lower surfaces of the magnetic disk.

The present specification states:

the outer surface of the its circumference is formed as a molding-free face. The judgment about whether the surface is a molding-free face can be made by observing it with a scanning electron microscope (SEM) or the like. In the case of a polished surface, fine marks made by polishing are left. On the other hand, the molding-free face is a smooth surface," (page 4, ll. 7-12 of the specification).

↓
In other words, the molding-free face is not a process limitation. To the contrary, the molding-free face is a physical limitation, which can be observed with a microscope and qualitatively characterized as smooth. Therefore, a molding-free face is not a process limitation. Therefore, this limitation has patentable weight.

Because Sakai does not suggest or disclose "waviness no greater than 0.5 nm," or "a molding-free face," Sakai cannot anticipate the claimed invention. Further, in view of the lack of teaching of these aspects in Sakai, Sakai fails to render the claimed invention obvious. Thus, claim 1 is patentable over Sakai. Therefore, claims 2-4 and 6-8, which depend, directly or indirectly from claim 1, are likewise patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

III. Rejection under 35 U.S.C § 103

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai in view of U.S. Patent No. 6,277,465 ("Watanabe"). This rejection is respectfully traversed. Sakai fails to disclose or suggest a glass substrate according to claim 1 and Watanabe fails to provide that which Sakai lacks.

Watanabe teaches a surface roughness of the glass substrate and the variation of the surface roughness are suppressed to a predetermined range, however, Watanabe is


completely silent with respect to "waviness no greater than 0.5 nm" and "a molding-free face." Therefore, claim 1 is patentable over Sakai and Watanabe, whether considered separately or in combination. Thus, claim 5, which directly depends from claim 1, is likewise patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Concluding Remarks

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. Further, no new matter has been added by way of this reply, and thus, further consideration is not required. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 04558.053001).

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Respectfully submitted,

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